Newsletter of the North American Mycological Association

THE MYCOPHILE

VOLUME 50:6 SEPTEMBER / OCTOBER 2010 WWW.NAMYCO.ORG

Mushroom Apps for the iPod

by Joel Harmon

Mushroomers have long yearned for a portable, preferably pocket-sized, reference for field use. Some have carried species keys and other self-made pictorial aids in this quest; others hoped for the development of a hand-held DNA analyzer, a so-called bar code DNA reader, which at this point has yet to be developed, but which would be price-prohibitive for most of us.

As of this year, several amazingly economical programs for the iPhone and iPod have come into existence in rapid succession, permitting field mycologists to carry in their pocket a few ounces of instrument containing literally thousands of fungal portraits and descriptions, as well as simple keys and search functions.

The remainder of this article is devoted to describing each of these programs in some detail for those iPod owners who might consider purchasing them. Two of them, "Fungi" and "Wild Mushrooms of North America & Europe," are identically priced at $1.99 (not a misprint) while the third, "ID Mushroom Browser," is considerably more expensive at $14.99. My comments will emphasize details of the first two, which I purchased and installed. Because of its price and inadequate species numbers, I cannot recommend the latter.

"Fungi" Interesting but Flawed

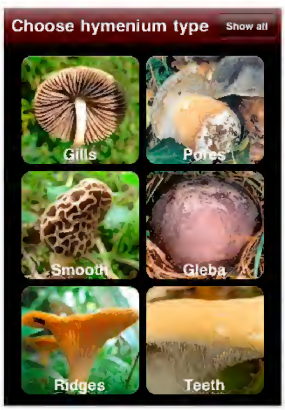
This program describes itself as a mushroom identification application "which allows you to search among nearly 500 mushroom species using a dynamic description system based on hymenium type, stipe characters, spore print color, and/or ecological type." It is based upon Wikipedia entries, and users with WIFI or 3G access can access the complete Wikipedia page of a designated species. However, the downloaded application itself has sufficient descriptive functionality on its own when no network is available. Below is a snapshot of the iPod screen showing an illustrative example of what may be expected at the conclusion of a search, or merely by browsing species. The search function is limited in that text body cannot be searched for a particular characteristic, e.g., taste or odor, but that is true of all these programs.

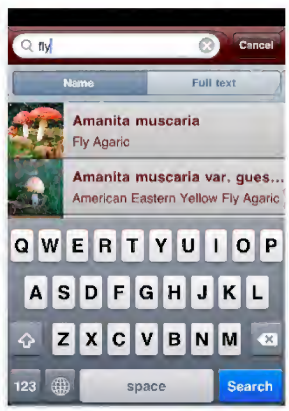
Inasmuch as the taxonomical information is based upon the latest Wikipedia entries, it is up to date and incorporates the latest revisions; for example, *Coprinellus* and *Coprinopsis* are used to refer to taxa that continue to be labeled *Coprinus* in the Roger Phillips "Wild Mushrooms" app, which is based upon his existing guides of 1981 and 1991, and the taxonomy that was then accepted. A minor annoyance with this program is that each initialization requires one to check a box agreeing to a waiver of liability. Another is a lack of the usual iPod functionality permitting a photo to be enlarged with a flick of the fingers. The database is a hodge-podge of species of various geographic origins, including Australia and Japan. A Reference tab is a valuable feature (not available in Phillips) which lists documentation for each species which the user can follow up.

Roger Phillips's App Amazes

When the Roger Phillips application was recently made available, I was floored. Not only is his entire *Mushrooms and Other Fungi of North America* incorporated into this app, along with all its photographs and text descriptions,

Continued on page 5





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FROM THE PRESIDENT

Since earliest times, people have had a curiosity about and an interest in mushrooms. In ancient Egypt the consumption of certain species allegedly was restricted to the Pharaohs and other royals. The renowned Greek physician Hippocrates wrote of the medicinal benefits of eating mushrooms around 400 B.C.

Surprisingly, the cultivation of mushrooms did not begin until 1652 in France. In North America serious mushroom cultivation started shortly after the Civil War, and of course today it is a multimillion-dollar, worldwide industry. Many species of cultivated mushrooms that until relatively recently were unknown to the public at large are now popular gourmet food items much sought-after by consumers.

Last April I had dinner with Ron Spinosa, Chair of NAMA's Cultivation Committee, and he updated me on his committee's Yahoo Group, which provides an opportunity for individuals interested mushroom cultivation to share information concerning all aspects of the art and science of cultivation, as well as offering them access to an incredible amount of data via connecting internet links. The group attracts a good deal of attention and now has nearly 500 members.

Ron says that the group has members from several countries, many of whom are just getting started in cultivation on a most rudimentary level. For these beginners this group provides an invaluable resource. If you have an interest in this aspect of NAMA's activities, please consider joining up with Ron's group as it will give you access to many interesting and useful materials beyond just those relating to cultivation. There is an extensive listing of articles as well as links to numerous cultivation websites. One set of particularly fascinating documents was entitled "Mushroom Cultivation for People with Disabilities Manual." The materials describe a joint program fashioned by a United Nations division and the Thailand Department of Public Welfare designed to:

> [R]each out to the disabled people in rural areas. The main objective of the project was to enhance opportunities for rural people with disabilities to become self-reliant and to show their capabilities, allowing them to re-integrate their community and be active members of society.

This program's goals seem to be closely related to those of a Swiss international organization, Zero Emissions Research Imitative (ZERI), i.e. to train farmers in undeveloped countries to use what would otherwise be waste product to create a self-sustaining mushroom cultivation business. At the annual meeting in Lafayette last November Ron gave a detailed presentation on this subject with the title, "Mushroom Alchemy: The Transmutation of Agriculture Waste into Protein, Jobs, Cash and Self-esteem."

Besides using cultivated mushrooms as a food item, ongoing scientific experimentation in Asia, Europe and the U.S. is probing deeply into cultured and uncultured mushrooms alike to evaluate their therapeutic properties. Here in Minnesota at the University there is research underway to establish the possible therapeutic application of certain chemical components of the cultured Turkey Tail mushroom (*Trametes versicolor*) in the treatment of cancer and other diseases. The NAMA Trustees at the annual foray in McCall, Idaho, two years ago favorably considered the creation of a Medicinal Mushroom Committee; and in that connection Martin Osis, Region XII Trustee and President of the Alberta Mycological Society, advises that he is moving ahead with the establishment of that committee and in addition has identified a well-qualified individual to serve as chairman. Martin will soon be soon seeking committee members. —*Bob Fulgency*

Moving?

Please send your new address, ***two weeks*** before you move, to

Ann Bornstein
NAMA Membership Secretary
61 Devon Court
Watsonville, CA 95076-1160
annstitcher@charter. net

Otherwise—you may not be getting your newsletter for a while. Each issue, several *Mycophiles* are returned as undeliverable because of no forwarding address on file. NAMA is charged ***seventy cents*** for each returned or forwarded newsletter.

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Special categories include
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The Mycophile is published bimonthly by the North American Mycological Association, 6586 Guilford Road, Clarksville, MD 21029

NAMA is a nonprofit corporation; contributions may be tax-deductible.

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CLUB EVENTS: *Clubs are encouraged to submit pictures of their annual events, both those for Club members and those focused on the general public, and a short description to the Editor of the* THE MYCOPHILE *for sharing of ideas for others and publication.*

Michigan Mushroom Hunters Club will host the "Fungus Fest" at Proud Lake Recreation Area, between Milford and Wixom, Michigan, September 24, 25, and 26. Art workshops are planned during the event. The MMHC plans to go to Hell (MI) complete with GPS location October 30th.

The **Colorado Mycological Society** went to Peru to hunt for morels recently . . . Peru, Nebraska!

The **Cornell Mycology Department** is hosting the 57th annual Charles Horton Peck New York State Mushroom Foray. The event will be held at the Watson Homestead Conference and Retreat Center in Painted Post, near Corning, NY, September 17–19. The Peck foray does not consist of a formal educational program, but is focused on joint collection and discussion.

The **Minnesota Mycological Society** (MMS) provided an exhibit at the State Fair August 26–27. This was the third time the MMS had exhibited, and they presented a wide variety of dried and fresh mushrooms. For the past two years the MMS has won the Grand Champion Prize for Exhibits! This year they planned to add educational activities for kids. Breaking news is that the MMS scored a hat trick and has now won the Grand Champion Prize for Exhibits three years in a row!

The MMS also reports having participated in the 7th annual BioBlitz, an intensive 24-hour survey of all living things, plants, animals, fungi, etc., at a particular location. BioBlitzs are part contest among teams, part festival, part educational event, and part scientific event. A BioBlitz encourages greater public awareness of living things in their neighborhood, and it also brings scientists from a wide variety of disciplines. In 2010 the BioBlitz resulted in identifying 159 plants, 126 insects, 107 two- and four-legged animals, and 110 fungi!

The **Illinois Mycological Association** reports that they are planning their annual show at the Chicago Botanic Gardens on Sunday, September 5th. Pat Leacock and Andy Wilson plan to lead a Foray the day before to collect specimens for the IMA exhibit.

NAMA Committee News Calling All Mushroom Cultivators

Are you are a mushroom cultivator or have an interest in mushroom cultivation? If so I would like to invite you to join the NAMA Mushroom Cultivation group! This group is for use by NAMA members and members of affiliated mycological societies. It is also open to others who have a serious interest in mushroom cultivation. The purpose is to serve as a forum for mushroom cultivators or those who have an interest in mushroom cultivation. It is also intended as a vehicle for posting articles, for asking questions, and sharing helpful hints, new techniques, or any other information that would be useful for mushroom cultivators.

The NAMA mushroom Cultivation Group is hosted by Yahoo Tech Groups. To join go to http://tech.groups.yahoo.com/group/NAMA_mushroom_cultivation and follow the instructions.

We hope you will join this group. Let us know what mushrooms you are cultivating, your level of cultivation experience, and what information you would like to see on this site. Post your cultivation questions, and chances are someone can help you.

—Ron Spinosa, Chairman
NAMA Cultivation Committee

NAMA NEWS: Election Held!

Congratulations to Linnea Gillman on her election as NAMA Secretary, and thanks for all her hard work at making the 50th NAMA Foray a success!

Awards:

Congratulations to Allein Stanley, who was honored with NAMA's Award for Contributions to Amateur Mycology.

Congratulations to Paul Sadowski, who received the Harry and Elsie Knighton Service Award.

The President's Award was given to two individuals this year: Judith McCandless, NAMA Treasurer, and posthumously to Kit Scates-Barnhart.

MUSHROOM RECIPES

Hazel Dell's Ham and Mushroom Pâté

1 Tbsp. butter
1½ cup chopped wild mushrooms
1½ cup diced ham
3 oz. cream cheese
¼ tsp. dried thyme
1 drop hot sauce

In a food processor, chop mushrooms until fine. Sauté mushrooms in butter for 5 minutes until tender. Use a food processor to process the ham into very small bits. Add the thyme and the hot sauce. In a medium bowl, blend the mushrooms, ham, and cream cheese. Pack into a serving bowl or mold and refrigerate 2–3 hours. Serve with crackers, bagel bits or as a filling in celery stalks.

Submitted by Karen Ryan from Hazel Dell Mushrooms, and reprinted from the *Spores Afield,* the Newsletter of the Colorado Mycological Society, May 2010.

Morel Fondue

1 cup morels, chopped
2 Tbsp. butter
¼ cup sherry
1 cup colby cheese

Sauté the morels in butter for 5 minutes until tender. In a food processor, blend at high speed until puréed. Pour into a fondue pot. Add the sherry and heat until bubbly. Add the cheese and stir until melted. Serve with cubes of French or Italian bread.

Submitted courtesy of Jimmy Graves of Graves Mountain Lodge in Syria, Virginia.

Morels à la Crème

8 oz. fresh morels
1 cup cream
2 oz. butter
Salt, pepper to taste
Optional ingredients as desired:
- 1 Tbsp. fresh Italian parsley, minced
- 1 large chopped shallot
- ½ cup of good, dry, white wine
- 1 small clove of garlic, minced
- ½ tsp. minced fresh herb such as thyme, basil, summer savory, or chervil

Heat skillet, add butter and mushrooms. Morels may be whole, sliced lengthwise of crosswise. Saute for 5 minutes. Add wine if using it and reduce. Add cream and herbs and reduce to desired consistency—less for pasta sauce, more for serving on bread as an hors d'oeuvres. It is also incredibly delicious on grilled chicken or steak.

Submitted by Patrice Benson and reprinted from *Spore Prints,* the Bulletin of the Puget Sound Mycological Society, May 2010.

Golden Chanterelle Puffs

1 cup chicken broth
½ pound chanterelles, minced
½ cup (1 stick) butter
½ tsp. salt
1 cup unbleached all-purpose flour
3 eggs

Preheat the oven to 450° F. Heat the chicken broth in a heavy medium saucepan. Add the chanterelles, butter, and salt and allow the mixture to come to a boil. Add the flour, stirring constantly until the mixture is smooth and almost leaves the sides of the pan. Remove from the heat. Beat one egg at a time into the mixture.

Drop tablespoons of the dough onto a buttered cookie sheet, spacing the spoonfuls about 2 inches apart. Bake at 450° for 15 minutes or until they are firm and golden. Cool the puffs on a rack.

Makes about 35 puffs. Serve with white wine, if desired.

Submitted by Louise Freedman [www.mssf.org/cookbook/chanterelle.html] reprinted from *Fungus Friends,* the newsletter of the Illinois Mycological Association, August 2010.

Life Boxes

Paul Stamets recently announced "The Life Box," a reinvention of the cardboard box, as a possible solution to climate change. Within the corrugations of these boxes are hundreds of tree seeds and thousands of friendly spores of mycorrhizal fungi. Once a customer receives whatever is shipped inside, the box is torn up, planted, and tree seedlings emerge.

"This is a 'shovel ready' solution to climate change," says Paul. The tree mix has been approved by the Departments of Agriculture for planting in every state in the continental United States (not Hawaii), and Canada.

Mushroom Apps for the iPod, continued from page 1

but also the entire volume of his *Mushrooms and Other Fungi of Great Britain and Europe* as well! Moreover, additional photos from his website are included, for a total of "some 2,400 photographs of over 1,550 Wild Mushrooms and other fungi." Those of us who remember the out-of-print first edition of the North American volume for sale on eBay for over $100 can only marvel. Happily, full-screen functionality is incorporated, so that both text and photos can be enlarged by a finger flick.

Despite my praises, the program is not without fault, particularly in its search functions. As with "Fungi," a visual key is provided that enables one to search by clicking on one of three choices: white or light spore print color; dark spore print color; or non-gilled fungi. Each choice will bring up a page of illustrations of various families or genera (Boletes, Clavarias, Collybia, Psathyrella, etc.) but without always specifying the exact color of the spore. Choosing one of these will bring up the entire available array of a genus—for example, 134 species of Boleteaceae, which one must skim through one by one without being able to enlist any further criteria. (By contrast, the smaller database in "Fungi" provides only 43 species.) Although a dichotomous key would have been helpful, the programmer was no doubt limited to available material, and the Phillips books have no species keys.

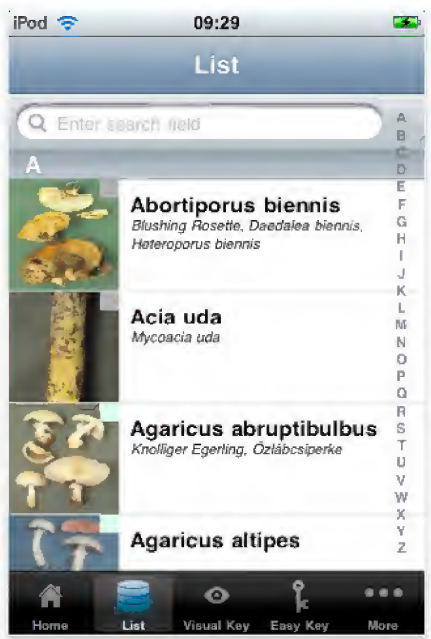
Another search function is called Easy Key and permits a search by the attributes of location (North America or Europe), edibility, fungus color, size, cap type, stem type, flesh (texture and latex), spore color, and habitat. While this function seems promising, and on occasion works well, more often than not it does not perform as it should, mixing in undesired attributes. It is hoped that future upgrades will improve this fault; and the developer provides a website address for submitting suggestions.

Comparing the two main contenders, the Phillips app is clearly the winner. Nevertheless, the Wikipedia-based "Fungi" has its strong points, its current taxonomy being foremost. And while the information furnished is uneven—sparse in some species and extravagantly detailed in others—it can be very useful in the latter case, particularly when discussing the difference between similar species. In this area, it can be considered complementary to Phillips. And considering the very affordable price, there is no reason not to have both these programs. If you are purchasing "Fungi" for the iPod, take care not to download "Fungi Kingdom," which is designed for the IPad and is higher-priced.

European Guides

Several European guides exist: "Pilzfuhrer" in German; "iChampi" in French (with an English version available) which also claims to allow one to share one's locations with others (not a desire in most collectors' minds!); "iFunch" in Italian (with an English version available) for $.99, which claims a 254-species database of "photos taken by fans throughout the world" and "a fast identification system based on morphological and color features." Inasmuch as the first version caused crashes, I was reluctant to download it.

An app to avoid is one titled "Common Choice Wild Edible Mushrooms," priced at $6.99, which received only poor ratings on the Apple iTunes website; reviewers considered it a waste of money. Another app, "Morel Mushroom Hunting Secrets," by the same developer, Chris Matherly, was also considered inferior and disappointing by the majority of users.



Healthy Codependency

Where: Pacific Northwest Research Station

Truffles, prized for centuries for the unique flavor they lend to food, have long been an elusive and prized ingredient for gourmet cooks, but their role in Pacific Northwest forests is one of down-to-earth practically.

Truffles are the fruiting bodies of fungi organisms found around the world. In the temperate rain forests of the Pacific Northwest, the roots of the fungi penetrate the soil and attach themselves to the root system of conifers and plants. The one-cell-wide filaments, called mycelia, do not photosynthesize, but absorb carbon and sugar from the host plants. In turn, the mycelia deliver essential nutrients—such as phosphorus, nitrogen and water—to their hosts. The mutually beneficial relationship is called mycorrhizal (Greek for fungus roots) symbiosis.

The cycle does not end there. As the mycelia mature, they develop reproductive organs, which we call truffles, that incubate spores underground. As the spores mature, they emit a strong odor, attracting forest mammals that eat them as a dietary staple. Northern flying squirrels—a favorite prey of northern spotted owls—consume them, as do voles, marmots, and opossums. These creatures in turn spread fungal spores via their droppings.

This intertwined, underground relationship has evolved through the centuries, and today the Pacific Northwest is home to more truffle species than anywhere else in the world except Australia.

Researchers with the Corvallis Forest Mycology program at the Pacific Northwest Research Station recently compiled forty years of truffle research into a detailed report, "Diversity, Ecology, and Conservation of Truffle Fungi in Forests of the Pacific Northwest," published this past spring [2009]. The report documents—and in some cases provides photos of—350 truffle species found in the area and lists the animal species that eat them. "If we're going to manage ecosystems, we need to understand [the fungi's] function," says Randy Molina, a retired U.S. Forest Service botanist whose work was included in the report.

Studies have shown fungi populations need large amounts of woody debris to thrive, respond better in areas that are thinned rather than clear-cut, and do better in forests with diverse tree species. Molina says truffle fungi are adaptable, variable, and cooperative, which makes them resilient to climate change. At any one point, he says, a host plant could be in a relationship with several dozen fungi species. If conditions change and some fungi can't function well, another species will step in. "It's one of the beauties of biodiversity," he says. "It's why it is a good idea to preserve species. We don't know which ones will be important in the future."

—Alice Tallmadge, Assist. Ed., *Forest Magazine.*
Reprinted by permission;
Forest Magazine 12:2, Spring 2010
www.fseee.org

Art and Natural Recyclers

The Art League of Houston, Texas, has announced the opening of "Natural Recyclers," a long-term project that features an earth media installation created by Divya Murthy and Nicola Parente for the Art League patio.

Using mainly recyclable and renewable resources, Parente and Murthy created a site-specific installation consisting of three giant mushrooms whose bases are fabricated from rebar, soil, and moss. The mushroom caps and stems are planted with Texas native and non-native edible plants and herbs.

The use of the mushroom reflects the important role that fungi play in the ecosystem through their use of decomposing materials as their source of nourishment. Parente and Murthy feel that the mushroom and its symbiotic relationship with the root structures of plants is the ideal symbolic gesture to promote environmental consciousness within our community.

"Wasted Resolve," an installation created by Parente and Murthy for the front gallery, will be open from November 13 to December 31. The piece is inspired by a 2008 *New York Times* article that ranked Houston as the worst recycler among the nation's 30 largest cities.

Recyclers, continued from page 6

"Wasted Resolve" is a visual categorized summary of unrecycled waste created from debris collected during a week-long period from an eight-block area surrounding Art League, Houston. The intent of "Wasted Resolve" is to make the viewer more aware of the city's waste consumption and to create a dialogue with the audience that focuses attention on the importance of reducing waste.

—Sandy Sheine (used with permission of KIAH-TV)

OUT TAKES:

Two of my favorite subjects: archeology and mycology have come together in a recent mini review study presented in British journal *Microbiology.* The study, "The Microbiology of the Lascaux Cave," by F. Bastian et al., describes efforts to conserve the Paleolithic cave paintings from the ravages of tourism and artificial lighting.

The cave was closed due to the growth of alga. Later there was widespread appearance of the fungus *Fusarium solani.* Recently, black stains have been noticed; these are believed to be fungal in nature. The study reports: "The microbial communities in Lascaux Cave were shown to be composed of human-pathogenic bacteria and entomophathogenic fungi. . . . The data show that fungi play an important role in the cave, and arthropods contribute to the dispersion of conidia." Additional study is called for. *Micobiology* (2010) #156 pp. 644–52

By the light of the 'shroom: **Luminescent Mycena: new and noteworthy species**

Work done on *Mycena* from around the world (Central and South America, the Caribbean [including Puerto Rico], Japan and Malaysia) has identified four new species and three previously described species, all of which are found to be luminescent. This work by D. Desjardin *et al.* brings the number of luminescent fungi to a total of 71. *Mycologia* (2010) 102(2), pp. 459–77

Underwater mushroom?

J. Frank *et al.* report that a species of Psathyrella with true gills has been observed fruiting underwater on alluvial gravel as well as submerged wood in the Rouge River in Oregon. Morphologiocal charecteristics such as long fibrillose stipe, with small diameter caps, a thin veil disappearing at maturity, and nonpink gill edges distinguish the underwater mushroom from previously described species. DNA studies place this mushroom near *P. automata, P. fontinalis,* and *P. superiorensis.* This new species, *Psathyrella aquatic,* adds a gilled mushroom to the number of stream fungi that degrade woody substances. *Mycologia* (2010) 102(1), pp. 93–107

International Team Sequences Truffle Genome

A team of international researchers from France, Italy and Germany reported in *Nature* that they have sequenced the genome of *Tuber melanosporum*, the black truffle from Périgord, France. The size and complexity of the genome consists of a preponderance of transposable elements. Over half of the genome comprises transposable elements which are particularly common in parts of the genome where genes are scare. Despite the large size, the actual gene content is small and streamlined. The organization appears distinct from other fungi, which suggests that the lineage of *T. melanosporum* may have diverged from other lineages over 450 million years ago.

Comparisons to the genome of *Laccaria bicolor,* sequenced a couple of years ago, suggest that symbiosis, similar in both species, may have evolved several times using different molecular toolkits, according to Francis Martin of the French National Institute for Agricultural Research, lead author of the study. The team found evidence for at least two mating types, which is consistent with sexual, as opposed to clonal, reproduction.

The team plans to work on sequencing the white truffle of the Piedmont. They also plan to genotype over 100 truffle populations in Italy, France, and Spain to try to identify DNA fingerprints to help truffle producers from various regions certify their products with the European Economic Community.

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THE MYCOPHILE

MUSHROOM OF THE MONTH

In the past we've featured unusual Foray finds, seasonal lichens, truffles . . .

This time the Mushroom of the Month is a pin! A significant pin, in that it recognizes NAMA's 50-year history.

The pin is available for $6 (six dollars U.S.), $5 for the pin and $1 for shipping and handling.

Bulk-rate shipping can be arranged for special orders or for Club sales. Please contact me at bruce_eberle@msn.com.

—The Editor